Bangalore Electricity Supply Company Limited

Technical Specification for supply of "ACB Painted/ Hot Dip Galvanized Structural materials Made From Mild Steel.

[1] SCOPE :

This Specification covers the supply of hot dip galvanized Structural materials, Cross Arms, Angles and MS Bolts-Nut-Washer set for HT/LT lines as per attached drawing (BOM) made from Structural Steel items conforming to relevant IS.

[2] APPLICABLE STANDARD:

The design, fabrication, hot dip galvanizing and testing of material used in manufacturing of HT/LT Structural Materials, HT/LT Cross Arms, HT/LT ST support, clamps & Nut-Bolt-Washer shall be in accordance with the latest edition of the following standards (Up-to-date) except otherwise specified in the Speciation.

Sl.no	Particulars	IS No.
1	Code of practice for use of structural steel	IS:800-1991
2	Specification for zinc ingot	IS:209-1992
3	Steel for general structural purpose Specification	IS:2062-1992
4	Recommendation practice for hot-dip galvanizing of iron and steel	IS:2629-1985
5	Methods for testing uniformity of coating of zinc coated Articles.	IS:2633-1986
6	Hot dip zinc coatings on structural steel and other allied products.	IS:4759-1996
7	Methods for determination of mass of zinc coating on zinc coated iron and steel articles.	IS:6745-1972
8	Method for measurement of coating thickness by eddy current	IS:6012-1992
9	M.S. Bolts Black Hexagonal head round neck with hexagonal nuts.	IS: 1363-1992 (Part 1 & 3)
10	Technical supply conditions for threaded steel fasteners	IS:1367-2002
11	Transmission tower bolts of property class 5.6 (For shear strength test)	IS:12427-1992
12	General Requirements for the supply of metallurgical materials	IS:1387-1993
13	Specification for plain washers	IS:2016-1992

3 GENERAL REQUIREMENT:

1. For line materials: Steel Material of MS Angle (not re-rolled) of Grade-'A' (Fe-410WA) should be used confirming to IS:2062-1992 and Weight as per IS 808:1989 with latest amendments. **Detailed sizes & thickness of MS. Channel, M.S Angele & Flats shall be as bill of material mentioned in the BESCOM Drawings attached to this specification Drawing Nos. details mentioned in the Annexure.**
2. Steel Material of MS Angle (not re-rolled) of Grade-'A' (Fe-410WA) should be used confirming to IS:2062-1992 and Weight as per IS 808:1989 with latest amendments.

3. MS Bolts Nuts shall be used conforming to IS: 1363-1992 Grade-C material. Washers shall be used conforming to IS: 2016-1992.

4. For hot dip galvanizing, the zinc ingot shall conform to Grade Zn(99.95%) as per IS:209-1992.
5. All testing shall be carried out as per provision under relevant IS applicable with latest amendments thereof.
6. All hot dip galvanized bolts and nuts shall have hexagonal heads. The heads, being forged out of the solid, truly concentric and square with the shanks must be perfectly straight. All bolts shall be threaded as per IS: 1363(1992) to take full depth of the nut and shall be threaded enough to permit firm gripping when fully tightened.

4. DIMENSION& WEIGHT:

The raw Material Dimension shall be accordance with the relevant Indian Standards IS 808:1989 with latest amendments. Fabrication and Bolt-Nut-washer dimensions shall be as per relevant Indian Standards.

Minimum weight of complete set will be as per Bill of Materials specified in the drawing and weight less than minimum weight shall not be accepted. For weight more than minimum specified, no extra charges will be paid.

5 PAINTING/HOT DIP GALVANISING

All structural steel components shall be either painted or hot dip galvanized as per the requirement.

5.1 PAINTING

All structural steel components shall be painted with two coats of good quality Anti Corrosive Black (ACB) paint after 2 coats of red oxide primer.

5.2 GALVANIZING:

1 The hot dip galvanizing shall be done after the fabrication work is completed.

2 The zinc deposition should not be less than specified, per galvanized surface area of the fabricated structure member.

3 The hot dip galvanizing and relevant tests shall conform to relevant IS 4759: 1996 and 2633:1972 and no. of dips shall be **4 of 1 minute each.**

4 All the members shall be fully galvanized.

5 Unless or otherwise specified, the minimum overall zinc coating –

(a) For plate G.I. thickness 5mm and above: **Zinc mass 610 Gram per Sq. meter of surface with coating thickness not less than 87 micron.**

(b) For Bolts – Nuts: Galvanizing shall be done as per IS: 1367 (part-13), 1983. Thickness of Galvanizing shall be as per IS: 2633 and other relevant IS.

6 The nuts can be tapped or re-run after galvanizing. Threads of bolts and nuts shall have neat fit such that it can be turned with finger throughout the length of the threads of bolts and they shall be capable of developing full strength of bolts.

6 QUALITY ASSURANCE PLAN:

6.1 The bidder shall invariably furnish following information along with his offer, failing which his offer shall be rejected.

1. Statement giving list of important raw materials, proposed to be used in the fabrication against this specification, names of raw material supplier, list of

standards according to which the raw materials are tested, along with copies of such test certificates.

2. Information and copies of test certificates as above, in respect of bought out items.
3. List of manufacturing facilities available with manufacturer in his premises.
4. List of testing equipment / facilities with valid calibration, available with the manufacture/supplier for testing as per relevant IS.

The Purchaser reserves the right for factory inspection to verify the facts quoted in the offer. If any of the facts found misleading or incorrect, the offer shall be out rightly rejected without assigning any reason.

6.2 The bidder shall also submit following information to the purchaser along with the technical Bid.

1) List of raw materials as well as bought out accessories, items, jobs etc., and the name of suppliers of raw materials as well as bought out accessories, items, jobs etc.
2) Type test certificates for MS Angle, Bolt-Nut-Washer and Galvanizing as applicable as per relevant IS at BIS approved NABL lab.
3) Quality assurance plan (QAP) verification points during purchaser's inspection.

(7) WORKMANSHIP:

1) All members as per BOM & Drawings shall be made from MS Angle and dimensions as per BESCOM approved drawings.
2) There shall not be any sharp edges in final product.
3) All welding shall be done as per relevant standards for use of 11 KV line stresses and welding shall be continuous
4) Quality and strength shall not be sacrificed.
5) All holes, cutting & welding process shall be as per dimension in finished product before the galvanization process without oversizing.
6) Finished fabrication shall meet general workmanship quality.
7) All supply shall be made from uniform material.
8) Hot Dip galvanization shall be done after completely finishing of the process of cutting, welding, bending, punching holes & punch marking.
9) The successful bidder shall submit the drawings & GTP and get approval from QS&S section for each item.
10) Mass production shall be commenced only after approval of drawing from QS&S section and prototype inspection if insisted.

[8] THE SAMPLING AND ACCEPTANCE:

The Nos. of sample randomly selected from the lot shall be in accordance with and acceptance criteria as per relevant IS.

During inspection offer, lot shall be properly stacked for proper verification and sample selection. **The tests shall be carried out ONLY on the finished material, having marking as described in this specification.**

Acceptance test shall be carried out in the Manufacturer's premises only.

[9] ACCEPTANCE TEST:

The Acceptance Test shall be carried out as per relevant IS on Samples for raw material as well as finished items are as under:

[a] For all items, Visual examination, verification of quantity of offered lot, "Marking" and Dimensions as per drawing.

[b] The Test reports/certificates shall be verified during inspection of the MS angle, MS Channels & M.S. Flat, test conducted at any NABL Laboratories which are used for fabrication of materials.

1. Verification of dimension
2. Yield Strength Test
3. Elongation Test
4. Bend Test
5. Chemical Composition test

[c] For Galvanizing:

1. Dip Test
2. Hammer Test
3. Mass & Uniformity of zinc test.

[d] Verification of Zinc coating over galvanized surface by Elcometer:

[e] Verification of manufacturer's test certificate for steel used in fabrication and submission of copy of the same along with inspection report. Failing which, dispatch instruction will not be issued.

[f] For Bolts-Nuts-Washers:

1. Visual inspection
2. Verification of dimensions as per relevant IS.
3. Checking of threads
4. Test certificate to be verify at the time of inspection.
   a) Mechanical (Tensile, proof of load and wedge loading) and Physical properties as per relevant IS: 1367 Part-3.
   b) Shear Strength of bolts as per IS: 32427-1992
   c) Galvanizing test on bolt & nuts.

[g] Verification of weight of complete set against minimum specified weight under inspection, which meets the relevant criteria [a] to [f].

[10] **ISI LICENSE:-**

In case of brought out raw material i.e. MS Angle, MS Flat, MS Nut & Bolts & washers the same shall be purchased from Supplier having valid BIS License during the material supply period.

[11] **MARKING:**

As per IS: 2062/1992, fabrication steel shall carry a tag marked with the Manufacturer's name or Trademarks, Designation of Steel should also be similarly marked.

All fabricated items shall be die punched marked if any (before galvanizing) of supplier having Company name (BESCOM) Type of the clamp/ X-arm for easy identification (PSCC or RCC) and PO number – Month – year of manufacturing as mentioned in the drawing by minimum size of Ariel-16 point font equivalent, and must be clearly visible.

For bolts, there must be symbolic impression on bolt head to identify the same having ISI properties.

[12] **PACKING**

The materials shall be suitably packed to avoid damage during transport

[14] **DELIVERY:**

Receipt at BESCOM stores shall be based on number of items, however, it is mandatory to maintain minimum specified weight of complete set during delivery at stores.

General Manager (Ele),
QS&S Section BESCOM

ANNEXURE

BESCOM website Typical Drawings details for the structural materials are as below (Approval shall be obtained from BESCOM QS&S section before Mass production

Sl.No	Particulars	Code	Typical Drawing No.
1	Single H Frame without Transformer Seating and Seating angle support cross arm for 11 Mtr Spun Pole for 63/100/ 250/ 500kVA (OH Line) - GI	**280129**	BESCOM/GMQS&S/68 Rev-02 Dated:24-11-2018
2	Single H Frame with Transformer Seating and Seating angle support cross arm for 11 Mtr Spun Pole for 250 kVA (OH Line) - GI	**280117**	BESCOM/GMQS&S/66 Rev-03 Dated:04-05-2020
3	Three H Frame without Transformer Seating and Seating angle support cross arm for 11 Mtr Spun Pole for 63/100/250/500 kVA (UG Cable) - GI	**280131**	BESCOM/GMQS&S/69 Rev-02 Dated:24-11-2018
4	Three H Frame with Transformer Seating and Seating angle support cross arm for 11 Mtr Spun Pole up to and including 250 kVA (UG Cable)) - GI	**280128**	BESCOM/GMQS&S/67 Rev-03 Dated:04-05-2020
5	Double Pole TC set for 25/63/100 kVA 4/5 Star Rated Transformer on PSCC Pole - 9 Mtr Long, 300 Kg WL - GI	**280111**	BESCOM/GMQS&S/62 Rev-02 Dated:24-11-2018
6	Double Pole TC set for 100/300 kVA 4/5 Star Rated Transformer on PSCC Pole - 9 Mtr Long, 300 Kg WL - GI	**280120**	BESCOM/GMQS&S/65 Rev-02 Dated:24-11-2018

Bangalore Electricity Supply Company Limited

SCHEDULE – I

SCHEDULE OF TECHNICAL PARTICULAR OF THE TENDERER REQUIRED FOR ASCERTAINING TECHNICAL ACCEPTABILITY OF OFFER. (THIS SCHEDULE – I DULY FILLED AND SIGNED SHOULD BE SUBMITTED ALONG WITH TENDER).

Sr.no	Description	For items of MS Steel Offered (To be filled up by Tenderer)
1	Name of the Manufacturer	
2	Standard Applicable, Whether the Tenderer or / Principal re-roller has valid BIS License to use IS Mark?	
3	Whether Materials will be supplied under BIS Certification Mark Scheme?	
4	Giver details of BIS License held. Attested copy of BIS License along with latest extension showing validity should be submitted. (This is a must).	
5	Whether the Materials will be Rolled from Tested Billets conforming to IS: 2830/ is: 6914 (Specify Quality) & Zn to IS:209/1992	
6	Whether Manufacturer possesses the facility to Rolls billets / Ingots / Slab as may be required for Rolling the Section?	
7	Whether Manufacturing Unit possesses will equipped Laboratory for Testing Mechanical and Chemical Properties of Raw and Finished Steel?	
8	Details of Quality Assurance Plan at the works of Manufactures for in House or bought out items.	
9.	List of Machineries installed / Available at the Manufactures works.	

Signature of Supplier/Manufacturer

Bangalore Electricity Supply Company Limited

SCHEDULE – II

[SUBMIT ALONG WITH TENDER TECHNICAL BID]

SCHEDULE OF TECHNICAL PARTICULAR OF THE TENDERER REQUIRED FOR ASCERTAINING TECHNICAL ACCEPTABILITY OF OFFER.
(THIS SCHEDULE-III DULY FILLED AND SIGNED SHOULD BE SUBMITTED ALONG
WITH TENDER)

Sr.no	Particulars	Particulars For items of MS Nut-Bolts- Washers Offered. (To be filled up by Tenderer)
1	Name of the Manufacturer	
2	ISI License for IS: 1363/84 (without latest amendments if any) a. License Number b. Date of Expiry	
3	List of Plant & Machinery	
4	List of testing facilities available	
5	M.S. Bolts Hexagonal head round neck with hexagonal nuts supplied confirming to IS:1363/84 with latest amendments if any .	
6	M.S.Bolts – Nuts shall bear ISI mark	
7	Size of M.S.Bolts, M16 X 180mm	
8	Size of M.S.Bolts, M16 X 65mm	
9	Size of Nuts& Washer as specification.	

Signature of Supplier/Manufacturer

Bangalore Electricity Supply Company Limited

SCHEDULE – III
(SUBMIT ALONG WITH TENDER TECHNICAL BID)

TECHNICAL DETAILS OF GALVANIZING FACILITY:

Sr. no	Particulars	
1	Nos. of facility and location	
2	List of Plant & Machinery	
3	List of testing facilities available	
4	Nos. of passes that are being carried out during galvanizing	
5	The Operational details of above	
6	Details of surface cleaning before galvanizing	
7	Details of Cooling facility	
8	Maximum Length of Heavy Structural Section that can be galvanized in this plant	
9	**RAW MATERIALS:** (I) Quantity required for Galvanizing the Section (II) Source of availability for Zinc (III) **Confirmation of Raw Materials from source to meet requirement.**	
10	Methodology / Steps adopted for quality assurance of galvanizing work in accordance with relevant IS:	

SCHEDULE – IV
(SUBMIT ALONG WITH TENDER TECHNICAL BID)

Sr. no	**Description of all items as per the Bill of materials/ drawings**	**Before galvanizing Approximate** weight of item in Kg (Upto 3 decimal)	**After galvanizing Approximate** weight of item in Kg (Up to 3 decimal)
1			
2			

3			
4			
5			

Signature of Supplier/Manufacturer